

A METHOD OF CULTIVATION OF BRYOPHYTES

Publication number: WO0189291 (A1)

Publication date: 2001-11-29

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Classification:


- **international:** **A01G1/00; A01G1/00;** (IPC1-7): A01G1/00


- **European:** A01G1/00

Application number: WO2001NZ00096 20010523


Priority number(s): NZ20000504717 20000523


Also published as:


 NZ504717 (A)


 AU6084401 (A)

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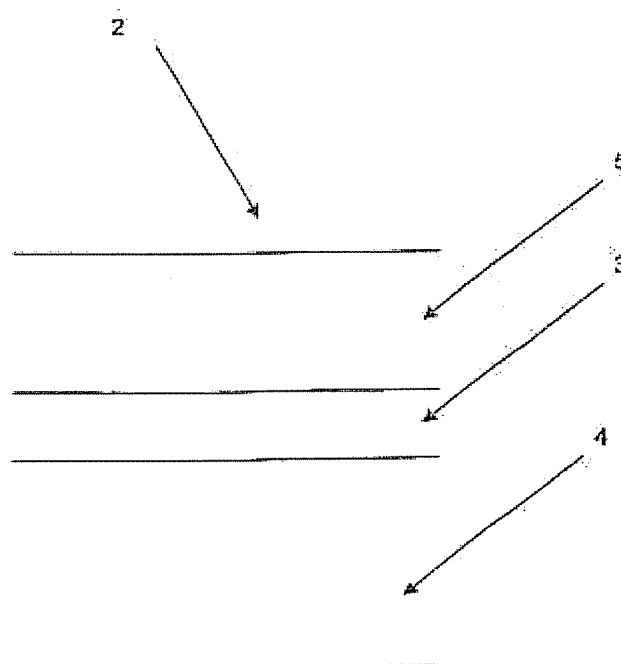
 JP10191774 (A)

 WO9517084 (A1)

 JP6173267 (A)

Abstract of **WO 0189291 (A1)**

A method of cultivating bryophytes such as Sphagnum sp. and other moss species, liverwort species or hornwort species comprising the following steps: (a) obtaining a substantially pure bryophytic inoculum (5); (b) laying a length of water-impervious film (3) on a supporting substrate (4); (c) distributing the inoculum (5) on the upper surface of the film (3); (d) providing the inoculum (5) with suitable conditions of light, temperature and moisture to permit growth; and (e) harvesting the resultant vegetative mat propagated from the inoculum (5).



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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
29 November 2001 (29.11.2001)

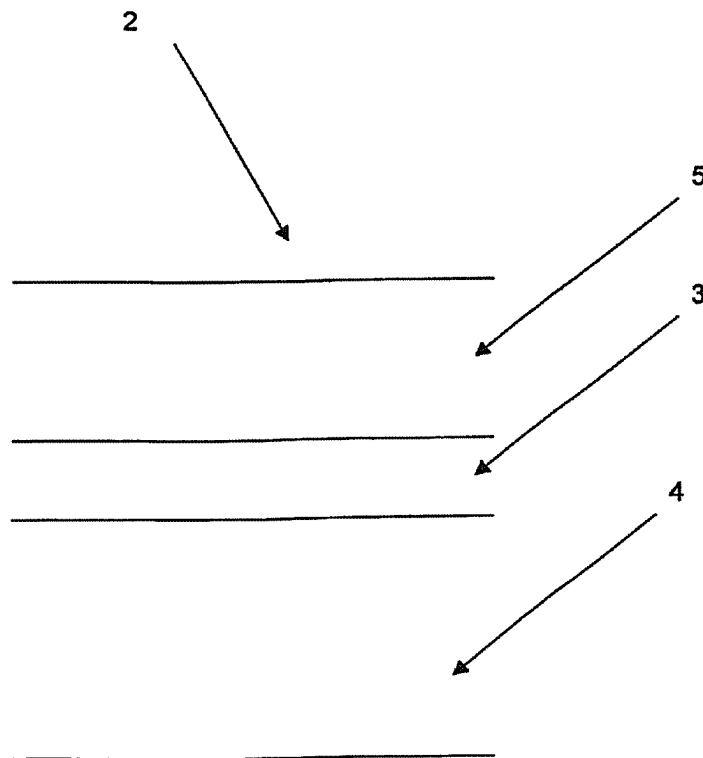
PCT

(10) International Publication Number
WO 01/89291 A1

- (51) International Patent Classification⁷: **A01G 1/00**
- (21) International Application Number: PCT/NZ01/00096
- (22) International Filing Date: 23 May 2001 (23.05.2001)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
504717 23 May 2000 (23.05.2000) NZ
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- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- (74) Agent: **BUCHANAN, Elspeth, Victoria**; P.L. Berry & Associates, P.O. Box 1250, Christchurch (NZ).
- Published:
— with international search report

[Continued on next page]

(54) Title: A METHOD OF CULTIVATION OF BRYOPHYTES



(57) Abstract: A method of cultivating bryophytes such as *Sphagnum* sp. and other moss species, liverwort species or hornwort species comprising the following steps: (a) obtaining a substantially pure bryophytic inoculum (5); (b) laying a length of water-impervious film (3) on a supporting substrate (4); (c) distributing the inoculum (5) on the upper surface of the film (3); (d) providing the inoculum (5) with suitable conditions of light, temperature and moisture to permit growth; and (e) harvesting the resultant vegetative mat propagated from the inoculum (5).

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

A METHOD OF CULTIVATION OF BRYOPHYTES

Technical Field

- 5 The present invention relates to a method of commercially cultivating bryophytes such as *Sphagnum* species.

Background Art

- At present *Sphagnum* sp. is harvested as an in situ crop without active propagation
10 and/or cultivation. The wild moss yield is dependent upon the environmental growth conditions such as a rainfall, light intensity, humus pH and level of ground disturbance. Consequently the wild moss crop must be sustainably managed to avoid depletion of this natural resource.

- 15 Harvested wild moss undergoes mechanical cleaning prior to processing or packaging to remove contaminants including seeds, seedlings, invertebrates (e.g. mites) and organic debris (e.g. pollen and leaf litter deposits). Frequently, the washed crop is fumigated to obtain a sterile inert substrate for use in or as horticultural growth medium, or compressed to form a liquid retentive liner.

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Disclosure of Invention

It is an object of the present invention to provide a method of cultivation for bryophytic plants and in particular *Sphagnum* sp. which is viable on a commercial scale, provides optimal growth conditions and yields a substantially pure monoculture.

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The present invention provides a method of cultivating bryophytes comprising the steps of:

- (a) obtaining a substantially pure bryophytic inoculum from a wild sample;
- (b) laying a length of water-impervious film on the surface of a substrate;
- (c) distributing said inoculum on the upper surface of said film;
- (d) providing said inoculum with suitable conditions of light, temperature and moisture to
- 5 permit growth; and
- (e) harvesting the resultant vegetative mat propagated from said inoculum;

Preferably said inoculum is a manually or mechanically cleaned sample containing saprophytic and gametophytic tissue. Preferably said film is a sheet of plastic film.

10 Preferably said substrate is selected from one of the following: a quadrant of ground (e.g. an area where bryophytes naturally occur, farmland or gravel bed), or an inert medium. Optionally, said method further includes a means of controlling the level of shade cover or light intensity to enhance vegetative propagation of said inoculum.

15 Brief Description of the Drawing

By way of example only, a preferred embodiment of the present invention is described in detail with reference to the accompanying drawing in which Fig. 1 is a diagrammatic cross section of a cultivation system in accordance with the present invention.

20 Mode for Carrying Out the Invention

Referring to Fig. 1, the bryophytic cultivation system 2 essentially comprises a length of water-impervious film in the form of a plastic sheeting 3, laid over the surface of a substrate 4, upon which sheet an inoculum of bryophytic tissue 5 is dispersed by tissue scattering.

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The inoculum 5 is a manually or mechanically cleaned sample of wild *Sphagnum sp.* Alternatively, the inoculum 5 may be derived from an axenic moss culture containing saprophytic and gametophytic tissue.

- 5 The substrate 4 is quadrant of ground in an area where wild *Sphagnum sp.* naturally occurs. The plastic sheeting 3 functions as a weed mat to prevent competitive plant germination, but periodic weeding may be necessary to maintain a substantially pure monoculture. The level of competitive plant germination from ground and airborne deposited seeds decreases as the inoculum 5 grows to form a vegetative mat
- 10 substantially covering the plastic sheeting 3.

- To enhance vegetative growth of the inoculum 5, the substrate 4 may be protected by a cloche or cold frame whereby the level of shade cover can be controlled by placement or removal of the or each frame cover (not shown). Alternatively, the shade cover may
- 15 comprise a length of shade cloth draped over and supported by a series of strained wires or clips. The inventor has noted that *Sphagnum sp.* proliferates in shaded habitats. The rate of vegetative growth can further be enhanced by monitoring and adjusting accordingly the pH and hydration level of the cultivation system 2 via a watering regime (if necessary) so that the growing moss is exposed to acidic and moist
- 20 conditions.

- The resultant *Sphagnum sp.* crop is harvested by removing the vegetative mat derived from the inoculum 5, from the upper surface of the plastic sheeting 3. A portion of the substantially pure crop is left to serve as the inoculum 5 for a subsequent crop.
- 25 Alternatively the plastic sheeting 3 with the vegetative mat are removed for processing and a new plastic sheeting is laid over the substrate 4 for the receipt of inoculum 5.

Whilst the cultivation system 2 has been described above in respect of *Sphagnum sp.*, it will be appreciated that the inoculum 5 could be any other bryophytic tissue derived from a wild moss, liverwort or hornwort species of commercial importance. Similarly, it will be appreciated that the inoculum need not be propagated and cultivated outdoors
5 but may be grown in a controlled environment wherein the substrate 4 is an inert medium.

Claims

1. A method of cultivating bryophytes including the steps of:
- 5 a) obtaining a substantially pure bryophytic inoculum;
- b) laying a length of water impervious film on a supporting substrate;
- c) distributing said inoculum on the upper surface of said film;
- 10 d) providing said inoculum with suitable conditions of light, temperature and moisture to permit growth; and
- e) harvesting the resultant vegetative mat propagated from said inoculum.
- 15 2. The method as claimed in claim 1 wherein said inoculum is a manually or mechanically cleaned sample containing saprophytic and gametophytic tissue.
3. The method as claimed in claim 1 or claim 2 wherein said film is a sheet of plastic film.
- 20 4. The method as claimed in any one of the preceding claims wherein said supporting substrate is located out of doors.
5. The method as claimed in any one of claims 1-3 wherein said supporting substrate is located indoors.
- 25 6. The method as claimed in any one of the preceding claims further including the step of providing a means of controlling the intensity of the light incident upon said inoculum.
- 30 7. The method as claimed in claim 6 wherein said means controlling the intensity of the light consists of a frame supporting removable shade cloth.
8. The method is claimed in any one of the preceding claims wherein the inoculum consists of bryophytic tissue selected from the group consisting of:
- 35

moss species, liverwort species, hornwort species.

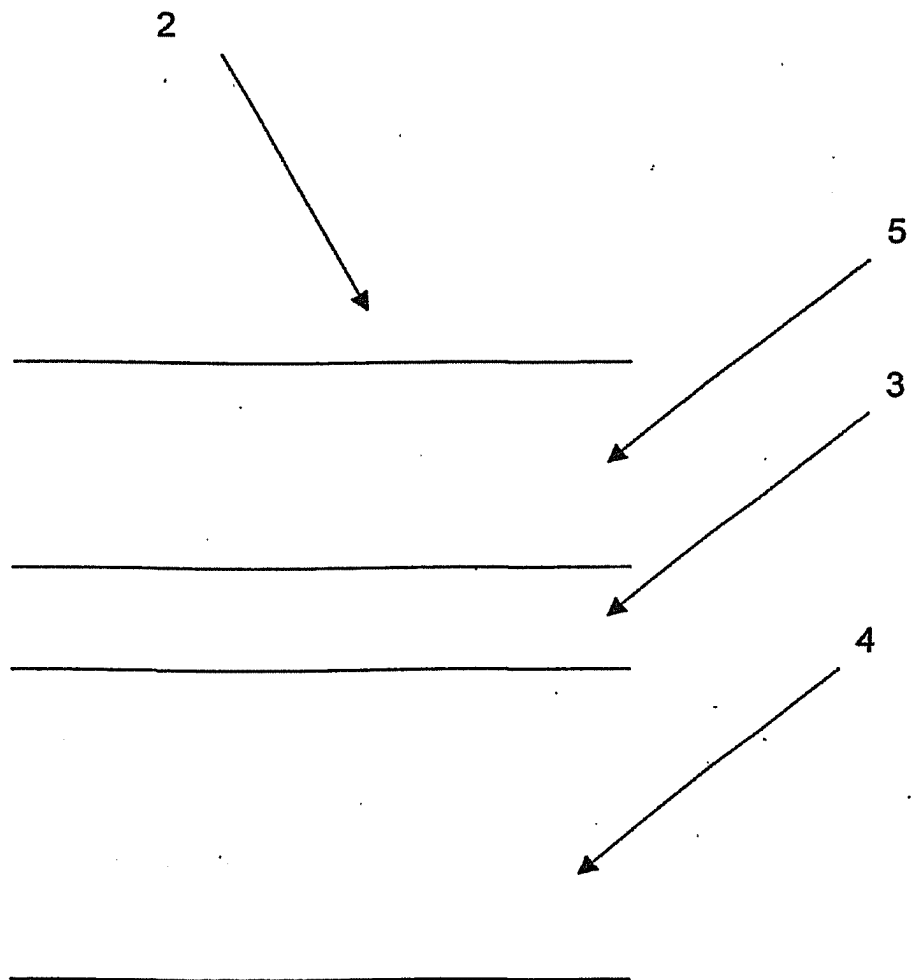
9. The method as claimed in claim 8 wherein said inoculum is obtained from wild *Sphagnum* sp.

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10. The method is claimed in claim 8 wherein said inoculum is obtained from an axenic moss culture.

Fig 1.

1/1



INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ01/00096

A. CLASSIFICATION OF SUBJECT MATTER		
Int. Cl. ⁷ : A01G 1/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU: A01G 1/00; A01H 11/00		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) DWPI with keywords (eg bryophyte, grow, sheet) USPTO and E-SPACE with keywords (eg bryophyte, sheet)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	Derwent Abstract Accession No. 98-459916/40, Class Q42, JP 10191774 A (SURION TEC KK) 28 July 1998 Abstract Figures	1-5, 8-10 6, 7
X Y	Derwent Abstract Accession No. 95-240400/31, Classes P11, P13, WO 9517084 A1 (TOSHIKEIKAKU KENKYUSHO CO LTD) 29 June 1995 Abstract Abstract	1-5, 8-10 6, 7
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
<p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>		
Date of the actual completion of the international search 29 June 2001		Date of mailing of the international search report 4 July 2001
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929		Authorized officer A. SEN Telephone No : (02) 6283 2158

INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ01/00096

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Patent Abstracts of Japan, JP 06173267 A (KAJIMA CORP CHEM GURAUTO KK) 21 June 1994	1-5, 8-10
Y	Abstract	6, 7
Y	Figures	
Y	CA 1185793 A (SAWRENKO) 23 April 1985	6, 7
	Figures	
	Note: The last document can be combined with any one of the other documents	

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/NZ01/00096

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report			Patent Family Member		
JP	10191774	NONE			
WO	9517084	AU 12019/95	JP 7227142	JP 7227143	
JP	6173267	NONE			
CA	1185793	US 3423486			
					END OF ANNEX